

## **10. Lead (Pb)**

Lead (Pb) is one of the most widespread toxic metals in the environment. It also is one of the most familiar air pollutants because of its long history and multitude of uses.

### **Sources**

Historically, the major sources of atmospheric lead have been from the combustion of lead-containing fuels, primarily gasoline. Since the phase-out of leaded gasoline, the most significant sources of Pb are point sources such as smelting industries. Other sources include the sandblasting of lead-coated surfaces and the combustion of coal.

Wind and rain affect the dispersion and deposition of atmospheric lead similar to particulate matter.

### **Effects**

Lead enters the body primarily through the consumption of lead-contaminated food and secondarily by direct inhalation. Lead is absorbed into the blood through the digestive tract or the lungs. Most lead (90 percent) is stored in the red blood cells, with the remainder ending up in bones, brain tissue and other organs. Those most at risk are young children, newborn infants and pregnant women. Children are more likely to have higher lead blood levels, due to their activity around lead-containing substances such as paint and dust. Pregnant women are a major risk group because lead can pass through the placenta to the fetus. The major toxic effect of lead is the reduced production of hemoglobin, the oxygen-carrying component of the blood. This can lead to anemia, damage to the central nervous system, kidney and liver, and high blood pressure in older adults. Lead can bio-accumulate over an individual's lifetime, eventually reaching toxic levels.

Even though the EPA has measured a decisive downward trend in outdoor lead concentrations, lead contamination is still a concern because of the metal's ability to accumulate over time in both the environment and humans.

Lead effects in animals are similar to the effects in humans, including the destruction of hemoglobin and central nervous system damage. Animals tend to be more at risk to lead exposure due to their intimate association with the environment. Thus, lead levels tend to accumulate and bio-magnify in wildlife.

Perhaps the greatest environmental impact of lead is its ability to interfere with the bacterial decomposition of cellulose, an important nutrient source for plants and animals. Lead also has been linked with deforestation in the higher elevations of the Appalachian Mountains.